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(56) Documents cited

GB A 2113337

GB 0614602

GB 0325588

GB 1394130

GB 0470704

GB 0314241

GB 0625345

(58) Field of search

F2H

Selected US specifications from IPC sub-class F16B

(54) Decorative nut, bolt or screw

(57) A nut, bolt or screw, e.g. a steel wheel nut (2) is fitted with a decorative, e.g. stainless steel, cap 4. The cap has an internal polygonal profile to match that of the nut and is retained by deforming the cap 4 inwardly by staking (8) at each apex of the nut. The metal of the nut (2) is deformed by the staking. Staking is accomplished by means of semi-circular dies in a press. The captive washer (3) is still free to rotate.

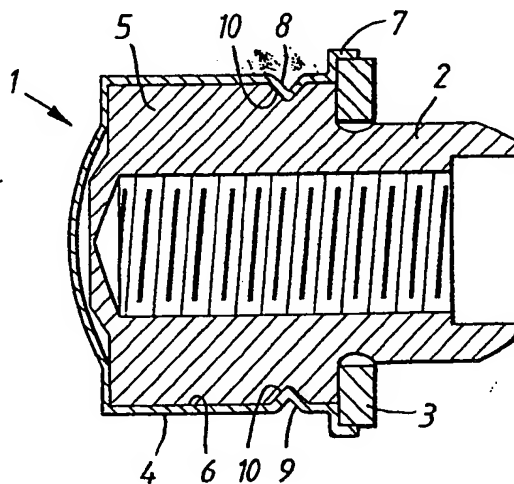


FIG. 1.

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The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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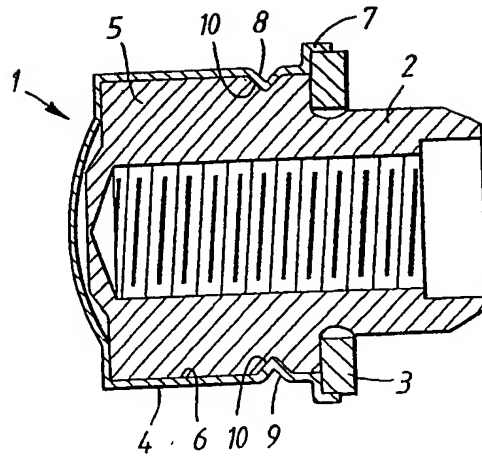


FIG. 1.

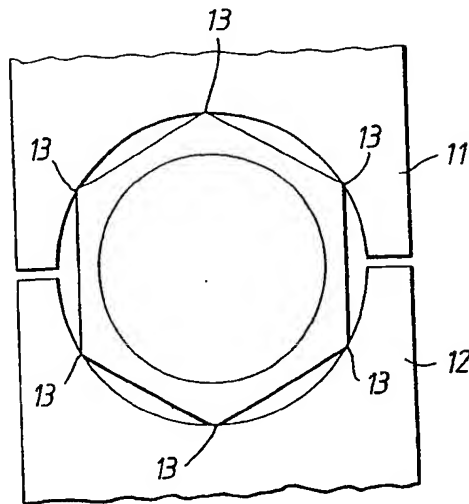


FIG. 2.

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## SPECIFICATION

## Decorated nut bolt or screw

- 5 This invention relates to a decorated nut, bolt or screw, that is to say a nut, bolt or screw having an appearance in the head region dictated by aesthetic as well as functional requirements.
- 10 Decorated nuts, bolts, or screws are used in applications where the appearance of a plain steel nut, bolt or screw or a plain steel nut, bolt or screw coated predominately with a view to preventing rust is not acceptable. A typical use is as the wheel retaining nuts,
- 15 bolts or screws of a motor vehicle.
- In the prior art it is known to apply a decorative plated finish, e.g. a chromium plated finish to a steel nut, bolt or washer to provide
- 20 the desired decorative effect. However, such plated finishes are commonly damaged during routine wheel changing operations, resulting in unsightly rusting of the underlying steel. It has also been proposed to provide a nut, bolt or screw with a decorative plastics cap which is a push fit over the head of the nut. However,
- 25 such plastic caps have the disadvantage that they must be removed before a wheel brace can be applied to the head of the retaining nut, bolt or screw. Caps thus removed are often not replaced by the person removing them, or are replaced insecurely with the result that they subsequently become detached and lost. Further, such plastic caps do not readily admit to providing a decorative reflective metal surface able to withstand the harsh environmental conditions to which wheel retaining nuts, bolts or screws are subjected.
- 30 It has been proposed to furnish the head of a wheel nut with a stainless steel cap which is welded to the underlying steel of the nut. However, such welding operation is complex and expensive, and is especially difficult to carry into effect when the stainless steel cap is of relatively thin gauge material.
- 35 According to one aspect of the present invention there is provided a nut, bolt or screw having a polygonal head covered by a decorative metal cap, the cap having a polygonal internal surface which mates with the polygonal head and being permanently attached to the polygonal head by staking of the metal of the cap into interfering engagement with the head at least at some of the apices of the
- 40 polygon.
- According to another aspect of the present invention there is provided a method of making a decorated nut, bolt or screw comprising providing a nut, bolt or screw having a polygonal head; providing a decorative metal cap having an internal polygonal surface complementary to the polygonal head; locating the decorative metal cap on the polygonal head; and staking the metal of the cap into interfering engagement with the head at least at
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- some of the apices of the polygon. Preferably, no mating groove is preformed in the polygonal head to receive the staked metal of the cap, but rather staking is accomplished with sufficient force to deform the metal of the head to provide a groove into which metal of the cap is staked. Preferably the cap is staked at all apices of the polygon, and this is conveniently achieved by using a pair of substantially semi-circular dies which are closed to substantially define a circle and simultaneously stake all apices of the polygon.
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It has been found, surprisingly, that staking of the cap to the underlying nut, bolt or screw only at the apices of the polygon, without preforming a groove or notch in the underlying head results in an extremely rigid and permanent connection between the cap and the underlying head.

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- 85 The invention will be better understood from the following description of a preferred embodiment thereof, given by way of example only, reference being had to the accompanying drawing wherein:

- 90 *Figure 1* illustrates in axial cross-section a preferred embodiment of the invention; and *Figure 2* illustrates schematically a method of staking.

- Referring now to the drawing there is shown a decorative wheel nut 1 for a motor car comprising a steel nut 2 having a captively retained screw 3 and a stainless steel decorative cap 4. The nut 2 has a head 5 of conventional hexagonal profile, and the internal surface 6 of the cap 5 is hexagonal and closely mates with the hexagonal external surface of the head 5. The cap 4 includes a skirt 7 which is a clearance fit over the washer 3 and which accordingly hides the washer 3 from view without interfering with the operation of the washer 3.
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- The cap 4 is retained on the head 5 solely by staking at the apices of the hexagon. Fig. 1 is a section taken on the line connecting to diametrically opposed apices of the nut 2 and shows the stainless steel material of the cap staked inwardly at 8, 9 into interfering engagement with the underlying metal of the nut 2. Prior to assembly of the cap 4 onto the nut 2 no groove or notch is provided at the apices of the nut 2 to accommodate the inwardly staked material of the cap 4. However, staking is accomplished with sufficient force to form, at each apex of the nut, a small groove 10 into which material of the cap is received. The size of the grooves 10 has been somewhat exaggerated in the drawing in the interests of clarity.
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- Staking at all six apices of the hexagon can conveniently be accomplished using a pair of substantially semi-circular dies 11, 12 located in a suitable press. A nut 2, with a cap 4 pressed onto the head 5 is inserted between the dies in the orientation shown in Fig. 2, and the dies are closed to simultaneously
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stake the metal of the cap inwardly at the apices 13 of the hexagon. In this manner, a high staking force can readily be applied simultaneously to all apices of the nut, resulting in rapid and permanent staking of the cap onto the head 5.

Whilst the invention has been described with particular reference to the application of a stainless steel cap to a wheel nut, it will be appreciated that it is generally applicable to securing any suitable metal cap to the polygonal head of any nut, bolt or screw.

#### CLAIMS

- 15 1. A nut, bolt, or screw having a polygonal head covered by a decorative metal cap, the cap having a polygonal internal surface which mates with the polygonal head and being permanently attached to the polygonal head by
- 20 staking of the metal of the cap into interfering engagement with the head at least at some of the apices of the polygon.
2. A nut, bolt or screw according to claim 1 wherein the metal cap is of stainless steel.
- 25 3. A nut, bolt, or screw according to claim 1 or claim 2 wherein the nut, bolt or screw is provided with a washer, and the decorative metal cap extends over the washer but does not prevent rotation of the washer relative to
- 30 the nut, bolt or screw.
4. A nut, bolt, or screw according to claim 4 wherein the decorative metal cap includes a generally cylindrical skirt which surrounds the washer.
- 35 5. A nut, bolt, or screw according to any preceding claim wherein the cap is generally cup-shaped and the staking is provided adjacent the open end of the cap.
6. A method of making a decorative nut, or screw comprising providing a nut, bolt or screw having a polygonal head; providing a decorative metal cap having an internal polygonal surface complementary to the polygonal head; locating the decorative metal cap on the
- 40 polygonal head; and staking the metal of the cap into interfering engagement with the head at least at some of the apices of the polygon.
7. A method according to claim 6 wherein no groove to receive the metal of the cap is pre-formed in the head of the nut, bolt or screw, but rather the staking is accomplished with sufficient force to deform the metal of the head to provide a groove into which the metal of the cap is staked.
- 50 8. A method according to claim 6 or claim 7 wherein all apices of the polygon are staked simultaneously.
9. A method according to claim 8 wherein the staking is carried out by means of a pair
- 60 of substantially semi-circular dies.
10. A method of making a decorative nut, bolt or screw substantially as hereinbefore described with reference to the drawing.
11. A decorative nut, bolt or screw substantially as hereinbefore described with refer-
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ence to the drawing.

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